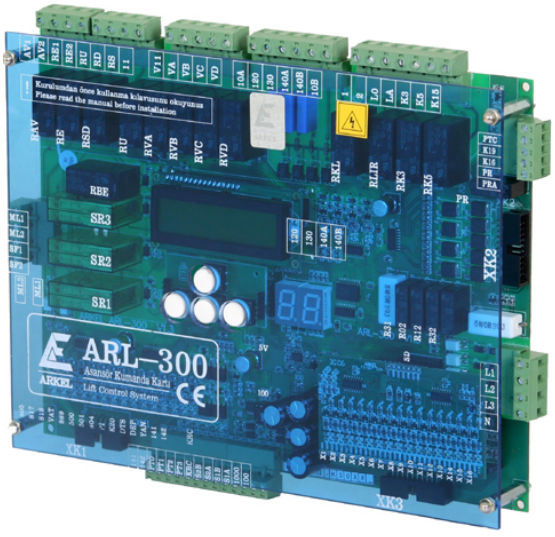
ARKEL

ARL-300

LIFT CONTROLLER



USER MANUAL

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INTRODUCTION

ARL-300 fulfills the requirements of Europian electric and hydraulic lifts directive EN81-1/2.

ARL-300 is universal. With just a few parameter changes; it can be used for hydraulic elevators or rope traction with two-speed or VVVF (geared and gearless drive), up to 24 stops, and for groups of up to 4 elevators up to 2m/s speed.

Most of the functions needed for any elevator system are integrated into the ARL-300 lift controller:

- Door-bridging safety relays in case of door pre-opening and re-leveling,
- Single automatic door support,
- Mains phase protection,
- Motor temperature monitoring,
- Binary, inverted Binary, Gray and inverted Gray code outputs for LCD and Dot-matrix indicators

ARL-300 is compitable with the serial car communication board FX-SERI (up to 16 stops) and FX-SERI-32 (up to 24 stops) which reduces labour and cable costs.

KBK connection boards are used with ARL-300 which are used instead of panel rail terminals and supplied with ribbon cables.

ARL-300 provides emergency rescue operations for electric (geared and gearless drive) and hydraulic elevators.

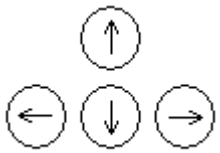
Technical Data

Description	**Value**
Dimensions Length × width × height	260 × 200 × 35
Working temperature	±0 - +60 °C
Degree of protection	IP20
Supply voltage	24 VDC ± 5 Vdc
Control inputs	24 VDC (High active)
Control outputs	24 VDC Short-circuit protected
Safety circuit voltage	Maksimum voltage 230VAC (**24VDC** for emergency lowering with Hydraulic systems **!!!**)

1. LCD SCREEN AND KEYPAD USAGE

ARL-300 has an LCD screen with 2-row and 16-character and 4-key keypad.

2-row 16-character LCD screen



STARTUP SCREEN

ARL-300 V1.4x SERI NO : 36-0298

When system is energized for the first time or restarted the "SPLASH SCREEN" appears. After being displayed this screen for about 3 seconds, "MAIN SCREEN" is displayed.

MAIN SCREEN

WAITS FOR CALL 100: 24V FLOOR: 1

The main screen shows the important lift parameters, 100 (Supply Voltage) and FLOOR (floor number).

ENTERING MENU

LISAN/LANGUAGE ENGLISH

In order to enter "MENU SCREEN", push and hold the LEFT button for 3 seconds. If there is no password has been entered before (0000: factory default) the first parameter "**LISAN/LANGUAGE**" is displayed on LCD.

ENTER PASSWORD 0000

If a password has been assigned before, you must enter the four digit password by pressing the UP and DOWN buttons. Then press the RIGHT button. The first parameter is displayed. If the password is entered incorrectly an error massage "**INVALID PASSWORD**" will appear on the LCD. If the password is entered incorrectly for three times, the system gets blocked and it is required to enter the PUK CODE.

You can pass through the parameters by pressing LEFT and RIGHT buttons and change the parameters by pressing UP and DOWN buttons.

When you change a parameter by pressing UP and DOWN buttons, the new value for that parameter is recorded in the temporary memory. It is not necessary to press any key to record any changed parameter. All parameters are recorded to the memory after leaving the program menu. If the power off the controller is turned off and on again before leaving the program menu, the parameters keep the older values.

EXIT FROM MENU

EXIT FROM MENU

In order to exit from the "MENU SCREEN", first push the RIGHT button until the "EXIT SCREEN" is displayed. When this screen is displayed push UP button to exit from the menu.

LCD CONTRAST SETTING SCREEN

KONTRAST
xxxxxxx

LCD display contrast can be adjusted by this screen. In order to enter this screen, press UP or DOWN keys while on main screen. UP key is used to increase and DOWN key is used to decrease the LCD contrast value. "**x**" signs are used to show the contrast value. After adjusting contrast value, entering menu is required for once in order to save this setting. Otherwise when the power turns off, controller will lose the changes.

GROUP STATUS SCREEN

GROUP STATUS
[A+] B- -- --

In order to enter this screen press LEFT button while on main screen. The working status of 4 lifts in a group operation are displayed on in this screen

A, B, C, D : The GROUP ID is defined for controllers in a group operation
+, - : Indicates the controller's status in a group operation while controller is in group communication
[ ] : The own GROUP ID of the controller
-- : Indicates the controllers which are not in a group operation or not defined

MANUAL MOVEMENT SCREEN

MANUAL MOVMENT
100:24V FLOOR: 1

In order to enter this screen, push and hold the RIGHT button for 3 seconds. UP and DOWN buttons are used for running UP and DOWN while in this screen. Press also the RIGHT button together for running with fast speed. Press LEFT button to exit this screen.

CALL SETTTING SCREEN

CALL SET : 1
ACTIVE CALL : --

In order to enter this screen, move with LEFT button while on main screen. Press UP and DOWN buttons to designate the call and press RIGHT button to activate the call.

RANDOM CALL SCREEN

RANDOM CALL : --
REMAINING :

It is possible to give random calls by using this screen. In order to enter this screen, move with LEFT button while on main screen. Controller generates a random call by pressing the UP button while on this screen. This call is displayed in the first line. After giving the first random call, press UP / DOWN buttons to designate the number of random calls. The number of random calls is displayed in the second line. The number of random calls is automatically decreased as the calls are acknowledged. Press LEFT button to exit this screen.

2. LIST OF PARAMETERS

The list of parameters in ARL-300 menu are listed below:

• LISAN/LANGUAGE
• LIFT TYPE
• NUMBER OF FLOORS
• COMMAND TYPE
• CAR CALLS FROM
• DOOR TYPE
• DOOR COMMANDS
• A.DOOR AT FLOOR
• WAITS AT FLOOR
• DOOR LOCK WAIT
• DOOR OPEN ERROR
• PHOTOCELL TIME
• CAR LIGHT DELAY
• PARK FLOOR
• PARKING TIME
• FIRE PARK FLOOR
• FIREMAN MODE
• MOTOR STAR TIME …… (for Hydraulic lifts)
• STAR/DELTA DELAY …… (for Hydraulic lifts)
• MOTOR STOP DELAY …… (for Hydraulic lifts)
• VALVE DROP DELAY …… (for Hydraulic lifts)
• CONTACTOR DELAY …… (for VVVF rope lifts)
• MAX FLOOR TO FLR
• MAX LOW SPEED T.
• DOOR PRE OPENING …… (for Hydraulic and VVVF rope lifts)
• RELEVELING …… (for Hydraulic lifts)
• BATTERY RESCUE …… (for Hydraulic lifts)
• RESCUE TYPE …… (for VVVF rope lifts)
• DISPLAY SETUP
• FX_SERI A,B,C,..
• PT0-PT3 OUTPUT
• BINARY/GRAY CODE
• PR RELAY FUNC.
• GONG OUTPUT
• RST PHASE CHECK
• FAULT LIST
• ERASE FAULT LIST
• LIMITS AT INSP.
• FUNCTION OF 120
• POSITION RESET
• EXT.SAFETY RELAY …… (for Hydraulic lifts)
• GROUP ID
• SERVICE TIME
• END OF SERV. TIME
• FIRST STOP
• LAST STOP
• VATMAN CALLS
• EVACUATION FLOOR
• MAX.CAR CALLS
• DIRECTION ARROWS
• PASSWORD
• EXIT FROM MENU

LISAN/LANGUAGE This parameter stores the language of the menu.

- **TÜRKÇE:** Turkish
- **ENGLISH:** English
- **NEDERLANDS:** Dutch
- **ROMANA:** Romany
- **Русский:** Russian
- **DUITS:** Germany
- **ITALIANO:** Italian

☞ 5 language options can be selected in the menu at the same time. ARL-300 menu languages are divided into 2 language groups. These language options are:

1st group: Turkish, English, Duits, Dutch and Russian
2nd group: Turkish, English, Duits, Romany and Italian

LIFT TYPE This parameter stores the drive type of lift.

- **HYDRAULIC**
- **2 SPEED ROPED L.**
- **VVVF ROPED LIFT**

☞ For VVVF roped lifts (geared and gearless drive) also the parameter "**RESCUE TYPE**" must be set according to the system.

NUMBER OF FLOORS This parameter stores the number of stops in lift system from 2 to 24.

- **2-24 stops**

COMMAND TYPE This parameter stores the lift command type.

- **SIMPLE COLLECTVE** : Car and landing call buttons are tied together. There is no difference between car and landing calls.
- **1 BUTTON UP&DOWN** : Car and landing call buttons are connected separately. Car calls and landing calls are collective in both directions.
- **1 BUTTON DOWN** : Car and landing call buttons are connected separately. Car calls are collective in both directions where landing calls are collective when the lift moves downwards.
- **1 BUTTON UP** : Car and landing call buttons are connected separately. Car calls are collective in both directions where landing calls are collective when the lift moves upwards.
- **2 BUTTON SEL.COL** : Car, landing up and landing down buttons all are connected separately. Car and landing call are all serviced in full collective manner.
- **UNIVERSAL** : Non-collective system. Car and landing call buttons are tied together.

CAR CALLS FROM This parameter determines the communication between controller and car.

● **MAINBOARD** : Parallel connection is used between controller and car. There is no serial communication board (FX_SERI) used in inspection box.

● **SERIAL E.CARD 16** : The serial communication board FX-SERI-16 is used in inspection box for connection between lift controller and car for up to 16 stops. Landing panels are connected as in parallel mode.

● **SERIAL E.CARD 32** : The serial communication board FX-SERI-32 is used in inspection box for connection between lift controller and car for more than 16 stops. Landing panels are connected as in parallel mode.

☞ For systems with more than 16 stops, it is required to use serial car installation in ARL-300 control system. FX_SERI_32 board must be used both in inspection box and in control panel.

DOOR TYPE This parameter stores the type of automatic door.

● **ONLY CAR DOOR** : Semi-automatic landing door and automatic car door
● **FULL AUTOMATIC** : Full-automatic car and landing door.

DOOR COMMANDS Automatic door open-close signal type.

● **CLOSE SIGNAL**: When only a door close signal is used. Door is closed when the door close signal is ON and door is open when the door close signal is removed. When 120 signal (stop circuit) is OFF, door remains close.

● **OPEN/CLOSE SGNL**: Door open signal and door close signals are used. Door is closed when the door close signal is ON. Door is open when the door open signal is ON. Door remains its position when there is no door signal ON. When 120 signal (stop circuit) is OFF, none of the door signals are activated.

According to the EN81-1/2, door movement must be prevented when emergency stop, inspection or recall modes engaged.

A.DOOR AT FLOOR Automatic door position when lift waits at floor level.

● **WAITS CLOSED** : Waits with closed door.
● **WAITS OPEN** : Waits with open door. (Not in conformity with EN81-1/2)

Waits open is not allowed according to the standard EN 81-1/2. So this parameter must be set to "**Waits closed**" to fully fit EN81-1/2. The lifts at the countries which has own standard other then EN81-2/2 or at the lifts that modernized and taken measures against risk of doors waiting open can be set as "**Waits open**".

WAITS AT FLOOR This parameter stores the time period for car to wait at floor before moving for the next call in collective systems.

- **0 to 60 seconds**

☞ If a serial communication board (FX-SERI) is used in inspection box and the OPEN/CLOSE button signals are connected to serial communication board, this parameter should be increased.

⚠ According to the EN81-1/2for semi-automatic doors, car must wait at least 2 seconds at floor before moving again.

⚠ For non-collective systems, the parameters "**WAITS AT FLOOR**" and "**CAR LIGHT DELAY**" should be set to same value and must be set to at least 2 seconds.

DOOR LOCK WAIT This parameter stores the maximum time period to wait for door lock signal (140) after door close signal comes to controller.

- **10 to 99 seconds**

Set this parameter to 35 s for semi-automatic doors and 95 s for full automatic doors.

DOOR OPEN ERROR At the end of this time period if doors still cannot be closed, controller gives an error and goes out of service.

- **10 to 240 seconds**
- **DISABLED:** Door open error function is disabled.

☞Set this parameter to 240 s for full automatic doors.

PHOTOCELL TIME This parameter stores the photocell time.

- **0 to 60 seconds**

CAR LIGHT DELAY This parameter determines the car light delay time.

- **DISABLED** : Car light delay is disabled (Not in conformity with EN 81-1/2 for semi-automatic doors)
- **1 to 240 seconds**

⚠ According to the EN 81-1/2 turning off car light delay is not allowed for semi-automatic doors.

⚠ For non-collective systems, the parameters "**WAITS AT FLOOR**" and "**CAR LIGHT DELAY**" should be set to same value and must be set to at least 2 seconds.

PARK FLOOR This parameter defines the parking floor.

- **DISABLED** : Parking floor is disabled.
- **1 to 24** : The parking floor of the elevator.

PARKING TIME When parking floor is not disabled and lift has no calls within this time, it moves to parking floor and stays there until a call comes.

- **0 to 250 seconds**

FIRE PARK FLOOR Fire parking floor number. When the fire input of the lift (terminal YAN) is activated then the car immediately moves to this floor and waits there with open doors. The elevator returns to normal operation after the fire signal is deactivated.

- **DISABLED** : Fire parking floor is disabled.
- **1 to 24:** The fire parking floor of the elevator.

FIREMAN MODE If the elevator serves as a fire-fighters lift then this parameter should be enabled.

- **DISABLED** : Fire-fighters mode is disabled.
- **ENABLED** : Fire-fighters mode is enabled.

☞ In ARL-300 system, the fire-fighters mode is only available with serial car installation. The input terminals 804, K20 ve DTS are used for connection of the signals required in fire-fighters mode.

804: Fire-fighters key switch input
K20: Door is fully open contact input
DTS: Door is fully closed contact input

The contacts used for door open and closed limits must be normally closed contacts. When door is fully open/closed these signals must be turned off.

MOTOR STAR TIME This parameter determines the switching time of the motor from star connection to delta connection in startup. (For hydraulic systems)

- **0.0 to 9.9 seconds**

STAR/DELTA DELAY This parameter determines the time to wait after finished the star connection and will start the delta connection. (For hydraulic systems)

- **0.0 to 9.9 seconds**

MOTOR STOP DELAY This parameter determines the delay time for main contactor to drop after a stop command. (For hydraulic systems)

- **0.0 to 9.9 seconds**

VALVE DROP DELAY This parameter determines the delay time for valves to drop after a stop command. (For hydraulic systems)

- **0.0 to 9.9 seconds**

CONTACTOR DELAY The time to keep the main contactor switch on after the movement ends can be adjusted by this parameter. (For VVVF roped lifts)

- **0.0 to 9.9 seconds**

MAX FLOOR TO FLR This parameter stores the maximum time allowed to pass without changing the current floor number.

- **5 to 120 seconds**

According to the EN81-1/2, the motor run time limiter shall function in a time which does not exceed the smaller of the following two values:

a) 45 s

b) time for travelling the full travel with rated load, plus 10 s, with a minimum of 20 s if the full travel time is less than 10 s.

MAX LOW SPEED T This parameter stores the maximum time allowed to reach the floor level after passing to low speed.

- **5 to 60 seconds**

DOOR PRE OPENING This parameter determines the activation of door pre-opening (for Hydraulic and VVVF rope lifts).

- **DISABLED** : Door pre-opening is disabled.
- **ENABLED** : Door pre-opening is enabled.

RELEVELING This parameter determines the activation of releveling for hydraulic systems (for Hydraulic and VVVF rope lifts).

- **DISABLED** : Releveling is disabled.
- **ENABLED** : Releveling is enabled.

BATTERY RESCUE This parameter determines the activation of the emergency battery lowering for hydraulic systems. (for Hydraulic lifts).

- **DISABLED** : Emergency battery lowering is disabled.
- **ENABLED** : Emergency battery lowering is enabled.

RESCUE TYPE The rescue type of the system for VVVF rope lifts (geared and gearless drive).

- **EXTERNAL OR NONE :** This option should be selected for geared asynchronous machines.
- **BRAKE RELEASE:** This option should be selected for gearless synchronous machines when the evacuation process is done by ARL-300 with releasing the brakes.
- **DRIVE WITH VVVF :** This option should be selected for gearless synchronous machines when the evacuation process is done by inverter with driving the motor (for evacuation with battery or UPS).

DISPLAY SETUP The floor settings for 7-segment displays or simple floor indicators are adjusted with the help of this screen. Press UP button during in this parameter to enter display setup screen. Then you can change the blinking parameter by pushing UP/DOWN buttons. Use LETF/RIGHT buttons for selecting floor number and its display setup. The display setup can be entered for each floor separately.

The floor texts can be selected for 7-segment displays and the output signals can be selected for simple floor indicators in ARL-300 menu are listed below:

Display type	Options
7-segment	-9, -8, -7, -6, -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, A, b, C, d, E, F, H, J, L, n, o, P, u, y, space, -, =, 1A, 1b, 2A, 2b
Simple floor indicator	K1, K2, K3, K4, K5, K6, K7, K8, K9, KX K1: Only A terminal gives output K2: Only B terminal gives output … K8: Only G2 terminal gives output K9: Only BC terminal gives output KX: All A, B, ... , BC terminals give output

The outputs A, B, C, D, E, F, G, BC and G2 on KBK-2 connection board are used for 7-segment displays at landings. In addition to this, the output 20 on FX_SERI_32 board is used for systems more than 16 stops. These outputs are also used for 7-segment display in car when car installation is paralel.

The simple floor indicator signals K1, K2, … , K8, K9 are respectively given from A, B, … , G2 and BC outputs (on KBK-2 and FX_SERI boards). For example, when K1 option is assigned for 1st stop, the simple floor indicator signal for 1st stop will be given from output A.

FX_SERI A,B,C,..

When FX_SERI serial communication boards are used, the code type of display outputs given from A, B, C, … terminals on FX_SERI boards is programmed by this parameter.

- **7 SEGMENT OUTPUT** : 7 segment code outputs
- **GRAY CODE OUT** : Gray code outputs
- **BINARY CODE OUT** : Binary code outputs
- **INVERTED BINARY** : Inverted binary code outputs
- **INVERTED GRAY C.** : Inverted gray code outputs

When display outputs are programmed to binary/gray code, A, B, C, D and E outputs give gray/binary code signals (M0, M1, M2, M3 and M4) respectively. Output A is the least significant bit and B is the most significant bit. Output E is only activated on FX_SERI_32 board for more than 16 stops.

For activating simple floor indicator outputs this parameter must be se to "7 segment output". A, B, … , G2 and BC outputs give K1, K2, …, K8 and K9 signals respectively.

PT0-PT3 OUTPUT

This parameter determines the code type of programmable outputs (floor position for LCD and Dot Matrix Display).

- **GRAY CODE** : Gray code output for position indicators
- **BINARY CODE** : Binary code output for position indicators

Programmable outputs PT0, PT1, PT2 and PT3 on ARL-300 board give gray/binary code signals (M0, M1, M2 and M3) respectively. PT1output is the least significant bit and the PT4 is the most significant bit.

The programmable outputs M0-M4 on FX_SERI_32 board are also programmed with this parameter. These outputs are used for systems more than 16 stops instead of PT1-PT3 outputs on ARL-300 mainboard.

BINARY/GRAY CODE

This parameter is used to determine the beginning code of outputs which are programmed to gray/binary code on ARL-300 controller or FX_SERI board.

- **0, 1, 2, 3** : Gray/Binary code outputs start counting from 0 (0 code output for 1st floor)
- **…**
- **15,16,17,18** : Gray/Binary code outputs start counting from 15 (15 code output for 1st floor)

PR RELAY FUNC.

This parameter is used to determine the function of PR programmable relay output on ARL-300 controller.

- **GONG OUTPUT** : Gong output. When serial car connection is used, terminal DD at FX_SERI board is used as gong output.
- **2nd MOTOR CNTRL**. : The second motor control output used for releveling of high power hydraulic systems.

GONG OUTPUT This parameter is used to determine the ding-dong timing.

- **ON DOOR OPENING** : Gong signal is activated when the door is opening.
- **WHEN SLOWING** : Gong signal is activated when the car slows down.
- **WHEN STOPED** : Gong signal is activated when the car stops.

RST PHASE CHECK This parameter determines the activation of phase order and phase failure protection.

- **DISABLED** : RST phase check is disabled.
- **ENABLED** : RST phase check is enabled.

FAULT LIST Controller saves the last 60 errors in its memory. By this, facility for maintenance and reparing is provided. Use UP button to display the fault list.

FAULT NO: 1 –H1
H1:FAIL TO LOCK

The list of the faults is displayed on the secreen. Last error is number 1 and the oldest error is number 60.

ERASE FAULT LIST All faults in the memory are erased. Press UP button and then press DOWN button to approve erasing fault list.

LIMITS AT INSP. On inspection mode this parameter defines if car stops immediately after reaching Bottom & Top limit switches or continue until to the floor level.

- **DIRECT STOP**
- **GO FLOOR LEVEL**

☞ Set this parameter to "**GO FLOOR LEVEL**" for systems with AKUS-SD evacuation unit.

FUNCTION OF 120 This parameter determines the manner of the controller when 120 signal cut off.

- **STOP ONLY** : When 120 signal is cut off, the system is stopped. After the signal comes back, controller returns to operation.
- **STOP & BLOCK** : When 120 signal is cut off, the system is stopped and blocked. In order to run the system, controller must be reset.
- **BLOCK LANDINGS** : When 120 signal is cut off, landing calls are blocked. Elevator returns to normal operation when a car command is given or when the landing door is opened.

POSITION RESET

Although the ARL-300 controller remembers the last position at any mains power failure, controller can reset its position after a mains failure. This parameter can be set to "**ENABLED"** for hydraulic lifts and rope lifts with AKUS-SD emergency battery leveling device. So the controller resets its position when mains power is live.

- **DISABLED**
- **ENABLED**

EXT.SAFETY RELAY

This parameter determines if there is external safety relay/contactor used with valves block connection. (for hydraulic systems)

- **INSTALLED**
- **NOT INSTALLED**

GROUP ID
CONTROLLER A

This parameter determines the GROUP ID of the controller in a group operation. It can be set as A,B,C and D. Each GROUP ID must be diffrent in a group operation.

- **CONTROLLER A to D**

SERVICE TIME

This parameter is decreased for each day as long as the controller runs. When this value becomes 0 the elevator behaves as set in the parameter "**END OF SERV TIME**".

- **0-255 days**

END OF SERV TIME

The controller's behaviour after the maintenance date is exceeded.

- **CONTINUE WORKING** : No action, even a warning message. Elevator runs as normal.
- **STOP** : Lift is blocked and stop operating waits for maintenance.

FIRST STOP

This parameter is only used for group operation. When each elevator has different number of stops in group operation, this parameter is used to adjust the first stop for the elevator which has difference. It is required to adjust the "NUMBER OF FLOOR" parameter to the same value for each elevator in group. For example, there is a dublex system with 10 stops, but elevator A does not serve to the bottom floor. The "NUMBER OF FLOOR" parameter must be set to 10 at each elevator and "FIRST STOP" parameter must be set to "AT BOTTOM + 1" at only elevator B.

- **AT BOTTOM FLOOR**: This elevator serves to the bottom floor in group operation.
- **AT BOTTOM + 1**: The first stop of this elevator is 1 floor above the bottom floor in group.
- **AT BOTTOM + 2**: The first stop of this elevator is 2 floor above the bottom floor in group.
- **AT BOTTOM + 3**: The first stop of this elevator is 3 floor above the bottom floor in group.

LAST STOP

This parameter is only used for group operation. When each elevator has different number of stops in group operation, this parameter is used to adjust the last stop for the elevator which has difference. It is required to adjust the "NUMBER OF FLOOR" parameter to the same value for each elevator in group. For example, there is a dublex system with 10 stops, but elevator A does not serve to the top floor. The "NUMBER OF FLOOR" parameter must be set to 10 at each elevator and "LAST STOP" parameter must be set to "AT TOP FLOOR - 1" at only elevator B.

- **AT TOP FLOOR**: This elevator serves to the top floor in group operation.
- **AT TOP FLOOR - 1**: The last stop of this elevator is 1 floor below the top floor in group.
- **AT TOP FLOOR - 2**: The last stop of this elevator is 2 floors below the top floor in group.
- **AT TOP FLOOR - 3**: The last stop of this elevator is 3 floors below the top floor in group.

VATMAN CALLS

This parameter determines the response type of the elevator during the VATman operation.

- **Single car call**: Only one call is active in VATman operation (Other calls will be canceled).
- **Last car call**: The last call will be active in VATman operation (Other calls will be canceled).
- **Multi car call**: All car calls will be active in VATman operation.

EVACUATION FLOOR

The evacuation floor number. When the evacuation function is enabled, elevator cancels all calls. Stops at nearest floor if it moves and goes to the evacuation floor. After it comes to the evacuation floor, it opens door and waits at this floor with open doors. After waiting 30 seconds, elevator closes the doors and returns to normal operation. The evacuation function is available only with serial car installation and it is enabled by using a panic button at car panel which is connected to the terminal 805 on ARL-300 controller that is not used when the car communication is serial.

- **DISABLED**: If there is no panic button on car operating panel this function must be disabled.
- **1-24**: Evacuation floor.

MAX.CAR CALLS

This parameter determines the maximum number of car commands. After reaching this number the car commands will not be accepted.

- **NO LIMIT**: There is no limit for number of car commands.
- **1-15** : Maximum number of car commands.

DIRECTION ARROWS

The operating type of up and down direction arrows (31 and 32 signals).

- **RUN DIR+NEXT DIR** : When the elevator is running, direction arrows indicate the running direction. When the elevator waits at floor, direction arrows indicate the direction of next travel.

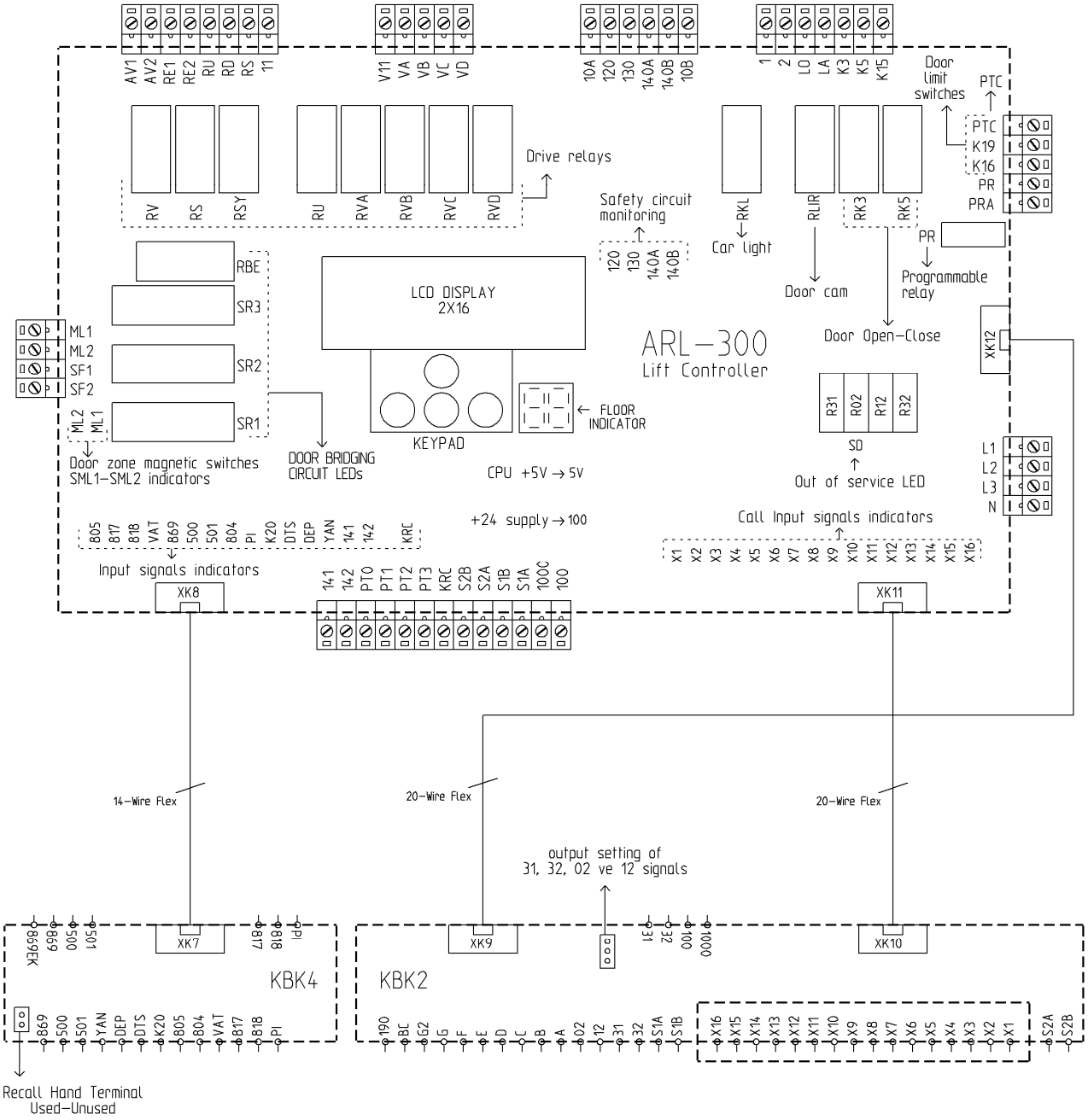
- **NEXT DIRECTION** : Direction arrows indicate the direction of next travel when the elevator waits at floor. No indication is given when the elevator is running.

PASSWORD 0000	The password to enter program parameters menu. Use UP/DOWN buttons to set the password. Don't forget your password. It will be asked to enter into the menu next time.
EXIT FROM MENU	In order to exit from the menu, push UP button.

3. ARL-300 ERROR CODES

CODE	ERROR
H1	FAIL TO LOCK DOOR. 140 SIGNAL IS MISSED
H2	FLOOR TO FLOOR MAX TRAVEL TIME ELAPSED
H3	DOOR IS NOT CLOSED FOR A LONG TIME
H4	MAX SLOW SPEED TRAVEL TIME ELAPSED
H5	BOTH LIMIT SWITCHS UP&DOWN IS OPEN
H6	TOP LIMIT SWITCH IS CUTS OFF WHILE RUNNIG DOWN
H7	BOTTOM LIMIT SWITCH IS CUTS OFF WHILE RUNNIG UP
H8	MOTOR PTC CIRCUIT IS OPEN. MOTOR OVER HEAT
H9	SYSTEM ERROR
H10	CONTACTOR CHECK BACK ERROR
H11	ML1 & ML2 SIGNALS SHORT CIRCUIT TO EACH OTHER
H12	DOOR BRIDGING RELAYS SR2 & SR3 DONT PICK UP
H13	DOOR BRIDGING RELAYS SR2 or SR3 DONT DROP
H14	DOOR BRIDGING RELAY SR1 CHECK BACK ERROR
H15	RST MAINS POWER SUPPLY FAILURE
H16	24V (100) SUPPLY IS UNDER LIMIT
H17	PTC SIGNAL OPEN. MOTOR OVER HEATED
H18	FAULT SIGNAL FROM VVVF DRIVER
H19	SAME GROUP ID NAME USED ON CONTROLLERS
H20	120 (STOP) SIGNAL IS MISSING. ELEVATOR BLOCKED
H21	EXTERNAL SAFETY RELAY CHECK BACK ERROR
H22	SERVICE TIME OVERFLOW

4. LEDs and JUMPERs ON ARL-300 BOARD

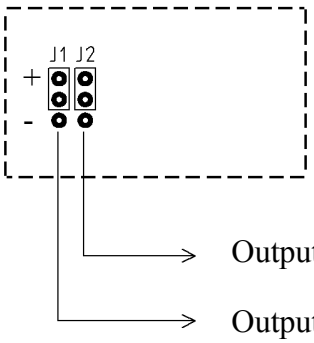

AV1 AV2 RE1 RE2 RU RD RS 11
V11 VA VB VC VD
10A 120 130 140A 140B 10B
1 2 LO LA K3 K5 K15
Door limit switches
PTC
PTC K19 K16 PR PRA
Drive relays
RV RS RSY RU RVA RVB RVC RVD
Safety circuit monitoring
120 130 140A 140B
RKL
Car light
RLIR
Door cam
RK3 RK5
PR
Programmable relay
Door Open–Close
XK12
RBE SR3 SR2 SR1
ML1 ML2 SF1 SF2
ML2 ML1
Door zone magnetic switches SML1–SML2 indicators
LCD DISPLAY 2X16
KEYPAD
FLOOR INDICATOR
DOOR BRIDGING CIRCUIT LEDs
CPU +5V → 5V
ARL–300
Lift Controller
R31 R02 R12 R32
SD
Out of service LED
L1 L2 L3 N
+24 supply → 100
805 817 818 VAT 869 500 501 804 PI K20 DTS DEP YAN 141 142 KRC
Input signals indicators
Call Input signals indicators
X1 X2 X3 X4 X5 X6 X7 X8 X9 X10 X11 X12 X13 X14 X15 X16
XK8
141 142 PT0 PT1 PT2 PT3 KRC S2B S2A S1B S1A 1000 100
XK11
14–Wire Flex
20–Wire Flex
20–Wire Flex
output setting of 31, 32, 02 ve 12 signals
869EK 699 500 501
XK7
817 818 PI
XK9
31 32 100
XK10
KBK4
KBK2
869 500 501 YAN DEP DTS K20 805 804 VAT 817 818 PI
190 BC G2 G F E D C B A 02 12 31 32 S1A S1B
X16 X15 X14 X13 X12 X11 X10 X9 X8 X7 X6 X5 X4 X3 X2 X1
S2A S2B
Recall Hand Terminal Used–Unused

5. FX_SERI Serial Car Communication Board

FX_SERI is used in inspection box with systems less than 16 floors for serial car communication with ARL-300 controllers.

Two wires will be enough and no other installation is needed betwen car and control panel for car buttons, indicators, over load, full load, gong, direction arrows, car lamp, automatic door open / close buttons and inspection operation buttons.

The code type of display outputs A, B, C, … on FX_SERI board can be programmed to 7 segment code, gray code, binary code, inverted gray code or inverted binary code by the ARL-300 menu.



2 jumpers are used for output settings of 31 (Down Arrow Indicator) and 32 (Up Arrow Indicator) outputs:

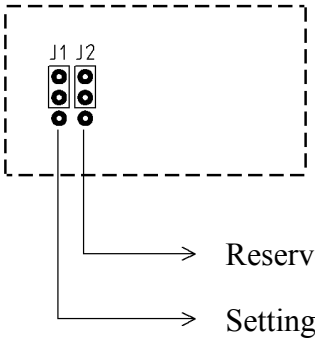
Plug jumpers to + and middle pins for signal output 100 (+24V)
Plug jumpers to - and middle pins for signal output 1000 (0V)

6. FX_SERI_32 Serial Car Communication and Call Input Board

FX_SERI_32 is used with systems more than 16 floors with ARL-300 controllers. It is used in inspection box for serial car connection and in control panel for call input-output connections with ARL-300 controllers.

When it is used in inspection box, two wires will be enough and no other installation is needed betwen car and control panel for car buttons, indicators, over load, full load, gong, direction arrows, car lamp, automatic door open / close buttons and inspection operation buttons.

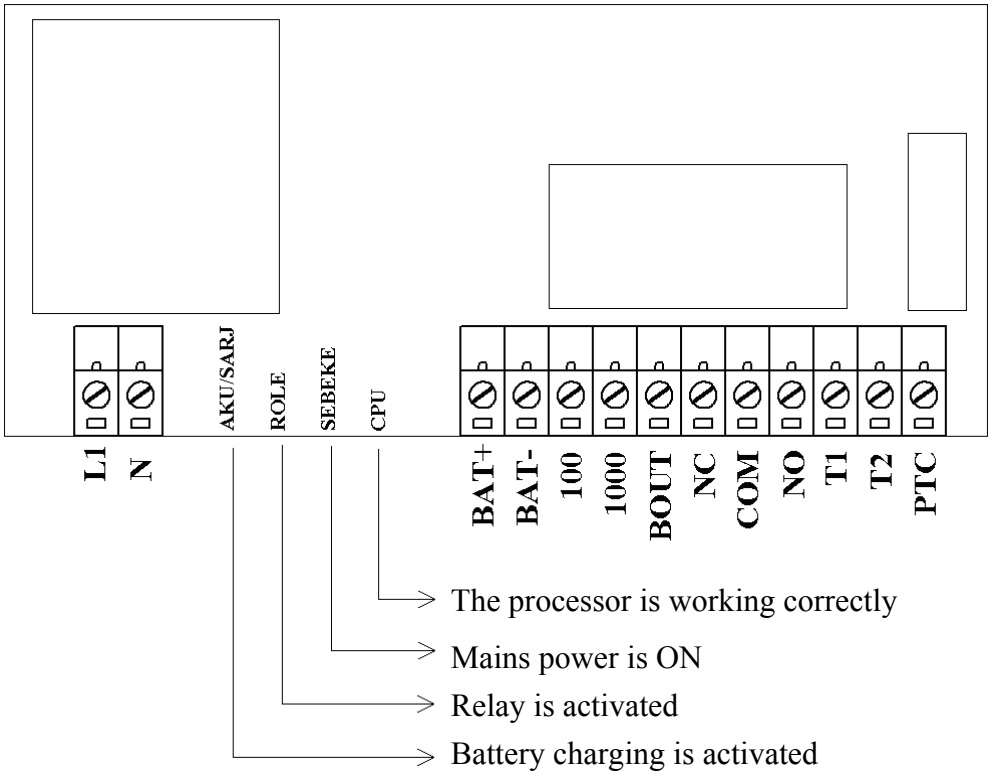
There are also gray/binary code outputs M0-M4 at FX_SERI_32 board which can be used for LCD and Dot-matrix indicators. The code type of outputs can be set by ARL-300 menu.



Jumper is used for selecting the usage of FX_SERI_32 board either for car calls or landing calls:

Plug jumper to upper 2 pins in case of using in inspection box for car calls
Plug jumper to lower 2 pins in case of using in control panel for landing calls

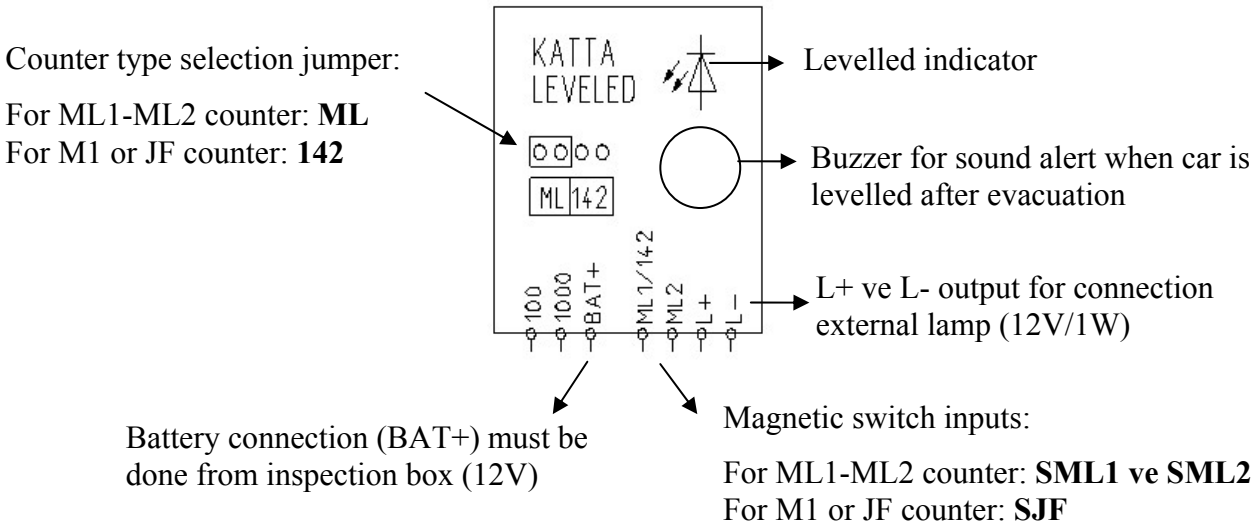
7. ARL-SARJ CHARGE CONTROLLER



ARL-SARJ board is used only with Hydraulic lifs. It charges the batteries (2 x 12V/1.2Ah) used for hydraulic emergeny lowering. (When mains power is off 24Vdc supply is required for ARL-300 controller and 12Vdc supply is required for safety circuits and for emergency lowering valve)

ARL-SARJ board checks the mains power in normal operation mode. It charges the batteries and gives the PTC signal to ARL-300 board according to state of terminals T1-T2 .

8. LEVELED INDICATOR BOARD



LEVELED indicator is normally used with hydraulic systems (Optional with rope lifts). It indicates the floor level with LEDs on it even the power is off. The board must also be supplied with a battery when there is no voltage at terminals 100-1000. After the car is levelled it also sounds an alert by buzzer. There is also a lamp output (12V/1W) which can be used to display levelled signal in a different place.

The magnetic switches which will be connected to LEVELED board (SML1-SML2 or SJF) must also be supplied with the battery (12V) in order to give signals to LEVELED board even the 24V is off.

9. INSTALLATION OF MAGNETIC SWITCHES AND MAGNETS

ARL-300 controller uses two different car positioning system listed below:

Standart M1 counter: Used with two-speed systems
ML1-ML2 counter: Used with VVVF and hydraulic systems

The following table shows the type of magnetic switches required for car positioning:

Car position sensing	Drive type	Door pre-opening and releveling	Required magnetic switches
Standart M1 counter	Two speed	NO	SM1 (Bi-stable) SJF (Bi-stable)
ML1-ML2 counter	VVVF/ Hydraulic	YES/NO	SML1, SML2 (Mono-stable) SJF1, SJF2 (Mono-stable)

9.1 INSTALLATION AND CONNECTION FOR M1 COUNTER

Installation of magnetic switches and magnets

M1 counter positioning requires 2 additional magnetic switches on the car top:

1. Floor counting ve deceleration magnetic switch (SM1, Bi-stable)
2. Level stopping magnetic switch (SJF, Bi-stable)

Bi-stable magnetic switches and round magnets are used for this positioning system. SM1 (ML1) magnetic switch is used for floor counting at the same time for deceleration of the car. SJF (142) magnetic switch is used for stopping at floor level.

- Install the round magnets carefuly according to wiring diagrams with taking care of the distance between magnets and the pole of magnets (see sheet 13).

Connection of magnetic switches

- SM1 magnetic switch is connected to terminals ML1-100.
- SJF magnetic switch is connected to terminals 142-100.

9.2. INSTALLATION AND CONNECTION FOR ML1-ML2 COUNTER

ML1-ML2 counter positioning requires 4 additional magnetic switches on the car top:

1. Door zone magnetic switches (SML1, SML2)
2. Travelling magnetic switches (SJF1, SJF2)

9.2.1. DOOR ZONE MAGNETIC SWITCHES (SML1, SML2)

1. Door Zone Magnetic Switch-1 (SML1, Monostable, NO-normally open)
2. Door Zone Magnetic Switch-2 (SML2, Monostable, NO-normally open)

SML1-SML2 magnetic switches inform control panel that the car is in door opening zone.

Installation of magnetic switches

- Install the SML1-SML2 magnetic switches on the cage beam in a pre-assembled bracket. SML2 magnetic switch must be on top of SML1 and two of them must observe the same side of guide rail.

Connection of magnetic switches

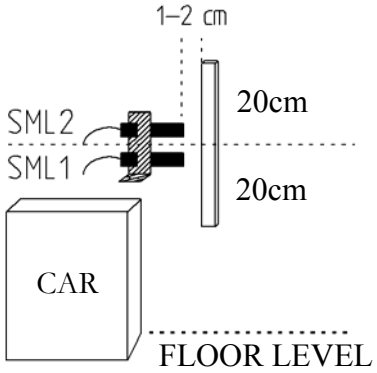
- SML1-SML2 magnetic switches are connected to plugs ML1-100 and ML2-100 respectively.

Ribbon magnets are used for this positioning system. The length of the zone magnets are approx. **40cm**. The number of zone magnets are determined by number of floor:

Number of ribbon magnets length 40 cm = Number of floor

Installation of zone magnets

- Move the car to the end of floors
- Car threshold must be exactly at the floor level
- Install the ribbon magnet opposite to the zone magnetic switches. The middle of the ribbon magnet must be on a level with the middle of the magnetic switches. The distance between magnetic switches and magnet must be **1-2** cm.
- **<u>40 cm ribbon magnets must be fixed with screw or glue</u>**
- Repeat this installing operation at all floors.



9.2.2. TRAVELLING MAGNETIC SWITCHES (SJF1, SJF2)

1. Downward travelling magnetic switch (SJF1, Monostable, NO-normally open)
2. Upward travelling magnetic switch (SJF2, Monostable, NO-normally open)

SJF1 and SJF2 magnetic switches are used to deceleration and stopping the car depending on the direction of travel. Moreover they are used to relevelling for hydraulic systems.

Installation of magnetic switches

- Install the SJF1 and SJF2 magnetic switches on the cage beam in a pre-assembled brackets separately. They must be installed side by side and must observe the different side of guide rail.

Connection of magnetic switches

- SJF1 magnetic switch is connected to plugs 141-100.
- SJF2 magnetic switch is connected to plugs 142-100.

The length of the zone magnets are approx. **10cm**. The number of zone magnets are determined by number of floor and can be calculated by the following formula:

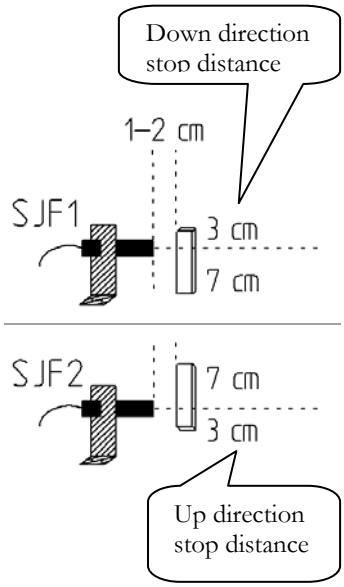
Number of ribbon magnets length 10 cm = (Number of floor x 4) -2

Installation of travelling magnets

There are two types of travelling ribbon magnets:

- Level stopping/relevelling magnetic switches
- Deceleration magnetic switches

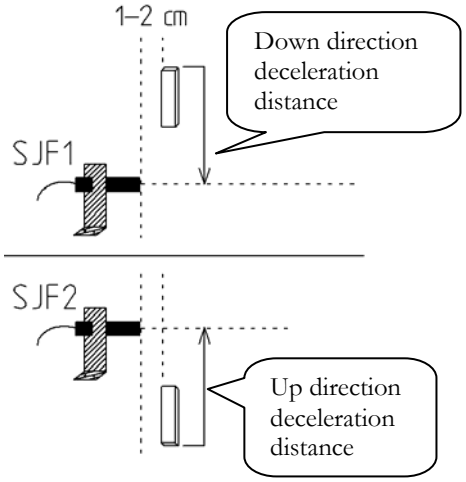
Level stopping/relevelling ribbon magnets



- Move the car to the end of floors
- Car threshold must be exactly at the floor level
- Install one of the ribbon magnets length 10cm opposite to the SJF1 magnetic switch. The middle of the magnetic switch must observe the ribbon magnet 3 cm above and 7 cm below. The distance between magnetic switches and magnet must be 1-2 cm.
- Install the other ribbon magnet length 10cm opposite to the SJF2 magnetic switch. The middle of the magnetic switch must observe the ribbon magnet 7 cm above and 3 cm below. The distance between magnetic switches and magnet must be 1-2 cm.
- Repeat this installing operation at all floors.

Note
The 3 cm distance of magnet above/below the magnetic switches is determined by the need of deceleration distance. It can be different in any system. It is required that both magnetic switches observe their magnets at floor level.

Deceleration magnets



- Install the ribbon magnet as deceleration distance above the SJF1 magnetic switch (Excluding the top floor).
- Install the ribbon magnet as deceleration distance below the SJF2 magnetic switch (Excluding the bottom floor).
- Repeat this installing operation at all floors

Note
The deceleration distance is determined by speed of the car. It can be different in any system and can be accepted 180 cm for VVVF systems and 60 cm for hydraulic systems.

10. CONNECTION OF TOP & BOTTOM LIMIT SWITCHES

ARL-300 controller is available with two different top & bottom limit switch options.

- Spool switches
- Bi-stable magnetic switches

10.1. USING SPOOL SWITCHES

Installation and connection of SKSR1 bottom limit switch and metal plate

- Move the car to the bottom floor. The bottom limit switch must be switched off when car is below the bottom floor level as deceleration distance. It means it must be switched when down deceleration signal for bottom floor is activated. Install the spool switch and metal plate according to this need.

- If the spool switch is mounted to car, it is connected to terminals 817-100 at car top. If it is mounted to shaft, it is connected to terminal 817-100 at control panel.

Installation and connection of SKSR2 top limit switch and metal plate

- Move the car to the top floor. The top limit switch must be switched off when the car is above the bottom floor level as deceleration distance. It means it must be switched when up deceleration signal for top floor is activated. Install the spool switch and metal plate according to this need.

- If the spool switch is mounted to car, it is connected to plugs 818-100 at car top. If it is mounted to shaft, it is connected to plugs 818-100 at control panel.

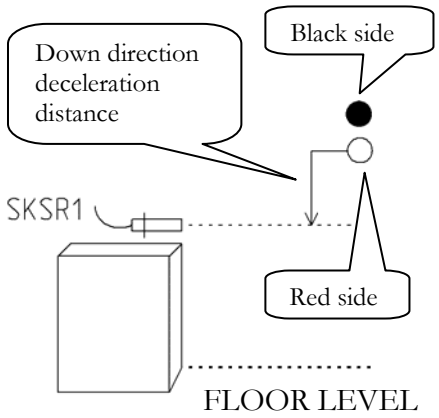
⚠ Note
Make the connection of up & down limit switches according to the wiring diagram
(see sheet 8 and 13)

10.2. USING BI-STABLE MAGNETIC SWITCHES

Installation and connection of SKSR1 bottom limit switch

- Install the SKSR1 bi-stable magnetic switches on the cage beam in a pre-assembled bracket.
- SKSR1 magnetic switch is connected to plugs 817-100.

Installation of round magnets for bottom limit switch

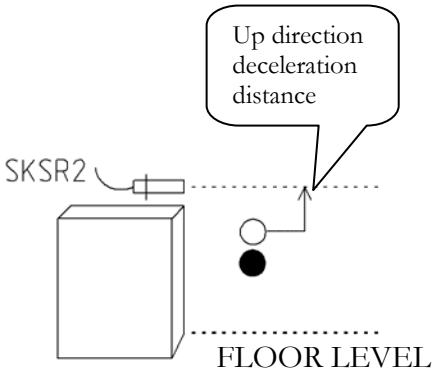


- Move the car to the bottom floor. Car must be exactly at the floor level
- Install the round magnet with red color side above the SKSR1 magnetic switch as deceleration distance. It means it must be switched on when down deceleration signal for bottom floor is activated.
- Install the round magnet with black color side a little above the red color magnet. It means it must be switched off when the car is out of the bottom limit zone. The distance between magnetic switch and magnets must be **1-2** cm.

Installation and connection of SKSR1 top limit switch

- Install the SKSR2 bi-stable magnetic switches on the cage beam in a pre-assembled bracket.
- SKSR2 magnetic switch is connected to plugs 818-100.

Installation of round magnets for top limit switch



- Move the car to the bottom floor. Car must be exactly at the floor level
- Install the round magnet with red color side below the SKSR2 magnetic switch as deceleration distance. It means it must be switched on when up deceleration signal for bottom floor is activated.
- Install the round magnet with black color side a little below the red color magnet. It means it must be switched off when the car is out of the top limit zone. The distance between magnetic switch and magnets must be **1-2** cm.

11. DOOR BRIDGING SAFETY CIRCUIT

The door bridging safety circuit is integrated in the ARL-300 controller board (SR1, SR2, SR3 safety relays and RBE relay) and enables car movements in the door zone with open car and landing doors. This makes approaching and relevelling with open doors possible.

The door bridging circiut requires two magnetic switches on car roof SML1 (door zone-1) and SML2 (door zone-2). SML1-SML2 magnetic switches must be installed in the same pre-assembled bracket and SML2 (door zone-2) magnetic switch must be on top of SML1 (door zone-1). 40cm ribbon magnets are used with door zone magnetic switches.

The door bridging operation can only be activated and commissioned if these two magnetic switches including magnets are installed and connected (see installation and connection of door zone magnetic switches).

⚠ **Note**
If the two functions "**Door pre-opening**" and "**Hydaulic relevelling**" are not required, the door bridging operation is not activated. But the magnetic switches zone-1 & zone-2 including magnets are required for ML1-ML2 counter positioning.

⚠ **Warning**
According to EN81, the maximum size of the door zone is 400mm (200mm in each direction). The actual dimensions of the door zone are forced by the length of the door cam.

- The distance to the door zone magnets must not be larger than the length of the door cam. Maximum length 40cm.
- The door zone magnets must be placed so both magnetic switches are closed in the door zone and open outside the door zone.

11.1. DOOR BRIDGING PRINCIPLE

The door bridging principle can be described with the following steps below :

- The relays SR1, SR2, SR3 and RBE are released in the beginning.

- If the car approaches the target floor with a slow speed, safety relay SR1 (starting door bridging) is activated by the controller.

- By the way SR2 and SR3 safety relays get ready to be triggered and activated by SR1 safety relay when car reaches the door zone. The safety relays SR2 and SR3 issue the zone message to the controller (car is in door zone).

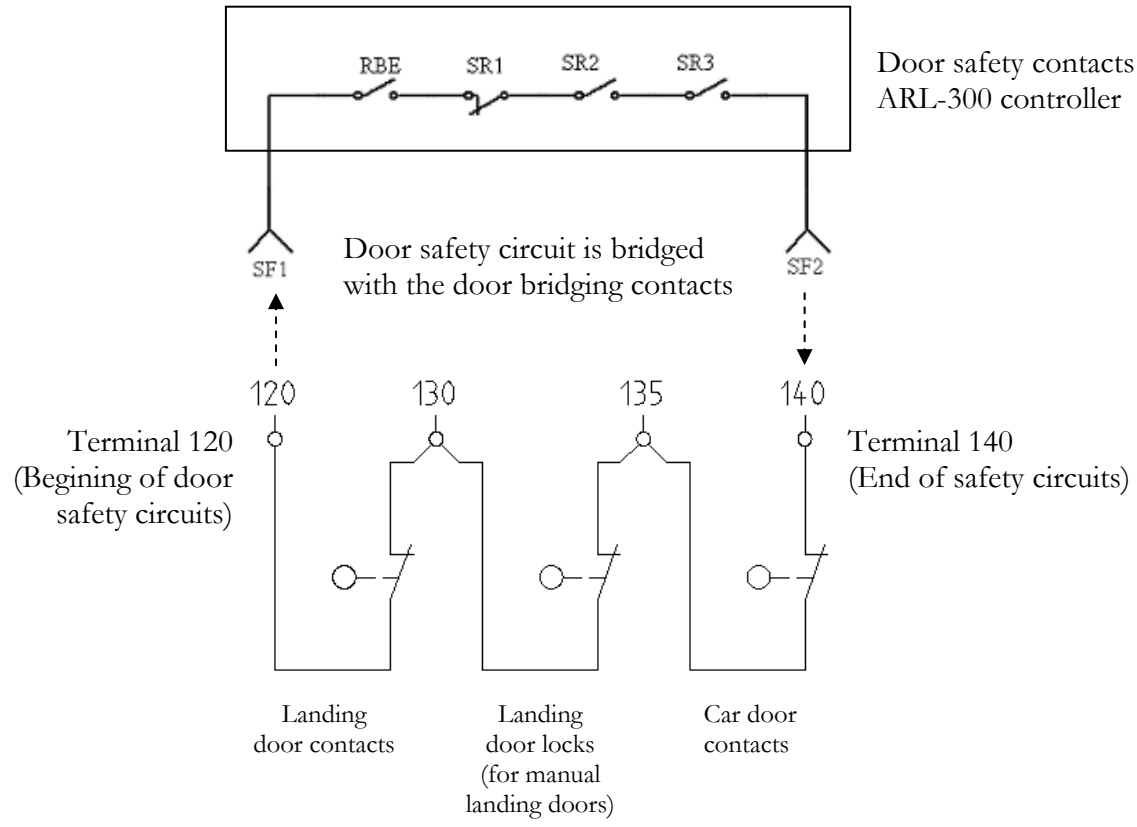
- If the car reaches the door zone, first the magnetic switches of door zone-1 (SML1) trigger and activate the safety relay SR2 (when running downward).

- After then the magnetic switches of door zone-2 (SML2) trigger and activate the SR3.

- The safety relay SR1 (starting door bridging) is released after the SR2 and SR3 relays are activated.

- After the control software received the bridging available message, the enable relay RBE is activated.

- These relays' state (RBE activated, SR1 released, SR2 activated, SR3 activated) bridges the door contacts in the safety circuit and allows drive movement with the doors open as showed in the following diagram.

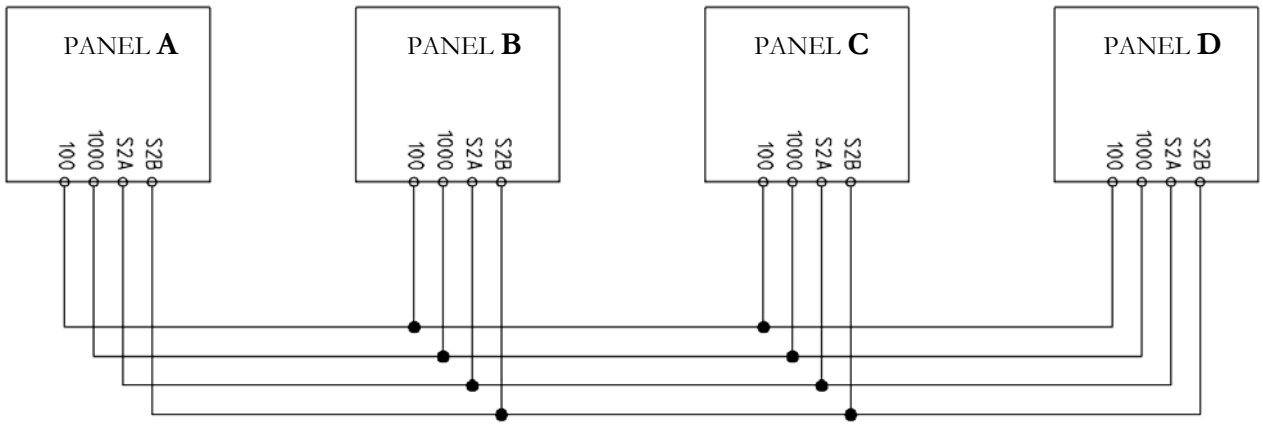


12. GROUP OPERATION

ARL-300 controller is available with group operation up to 4 elevators via RS-485 serial communication. 2 terminals S2A and S2B are used for group communication on ARL-300 controller.

12.1. CONNECTION OF CONTROL PANELS IN GROUP OPERATION

There is no need any extra group controller in group operation. Only to do is connecting each control panels. 4-wire cables are used for connecting all control panels in elevator group operation. Connection of 4 control panel is showed below:



12.2. CONNECTIONS OF LANDING BUTTONS IN DUBLEX OPERATION

Landing call buttons should be connected paralel to each control panel for dublex operation. So when one of controller goes out of group operation by any reason the other controller can carry out landing calls.

It is recommended to connect each landing call buttons to one one control panel for an elevator group of 3 and 4 elevators. By this way landing calls will not be connected to one of the controller in elevator group. But even some controllers goes out of group operation by any reason the other controllers can carry out landing calls and you can save on cables and connections.

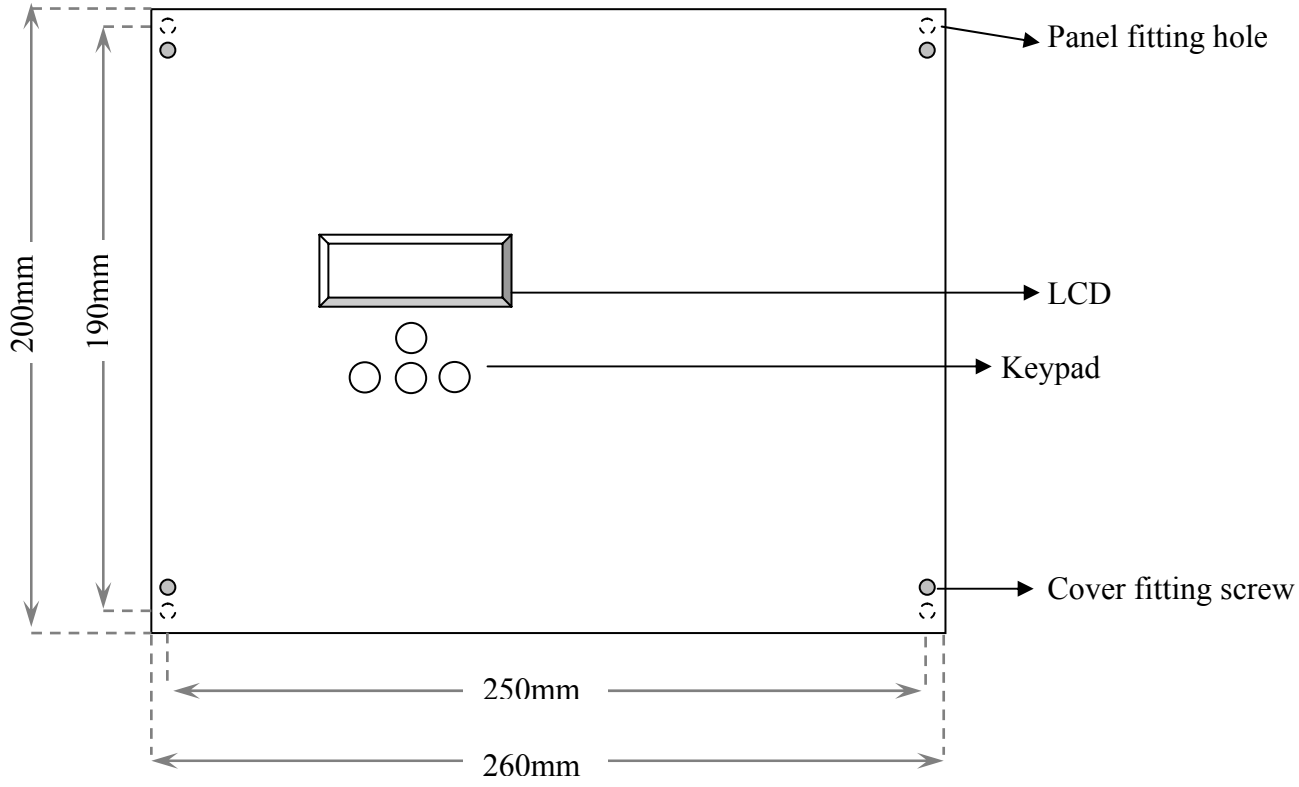
Operating of any landing buttons on any landing panel results in sending this information to all the lifts. All the landing buttons are illuminated when the call is registered and the group control program takes care the call.

12.3. GROUP OPERATION SETTINGS

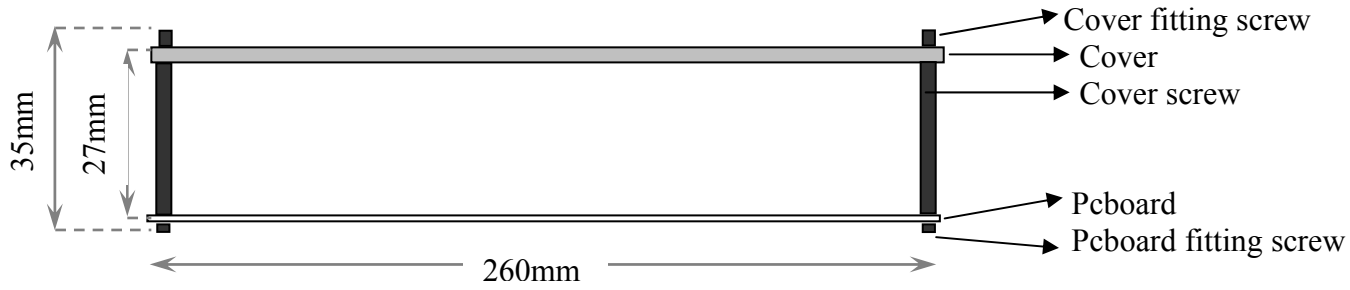
After connection of control panels in the elevator group only to do is setting each controller as A, B, C or D on ARL-300 menu. Each controller must have a different group ID. Group operation can be monitored on each ARL-300 controller's group status screen.

13. DIMENSIONS OF ARL-300 CONTROLLER

Front View



Sideway View



14. ARL-300 TERMINALS & PLUGS

14.1. Common Terminals On ARL-300 Controller

L1,L2,L3	Main Phase	
N	Neutral	
1	Car Supply Output (220Vac)	
2	Car Lamp Output (220Vac)	
LO	Relay Output of Retiring Cam (Common Contact)	
LA	Relay Output of Retiring Cam (Normaly Open Contact)	
K3	Door Close Signal Output	
K5	Door Open Signal Output	
K15	Door Open/Close Signal Common	
10A	Safety Circuit Supply Ground Input	
120	Stop Circuit Monitoring Input	Max. 230Vac
130	Landing Door Contacts Monitoring Input	
140A	Landing Door Lock Contacts Monitoring Input	
140B	Landing Door Lock Contacts Monitoring Input (During evacuation operation for rope lifts with AKUS-SD or hydraulic systems)	Max. 28Vdc
10B	Common of Main Contactors Output	
SF1	Door Bridging Relay Contact Common (120 circuit)	Only for VVVF and Hydraulic systems for door pre-opening and relevelling.
SF2	Door Bridging Relay Contact Output (140 circuit)	
ML1 (M1)	Door Zone Magnetic Switch-1 Input	These connections depend on the drive type of the elevator.
ML2	Door Zone Magnetic Switch-2 Input	
141	Down Stop & Deceleration Magnetic Switch Input	
142	Up Stop & Deceleration Magnetic Switch Input	
PT0	Programmable Output (M0: Gray/Binary Code Output)	The functions of programmable outputs are assigned from the menu.
PT1	Programmable Output (M1: Gray/Binary Code Output)	
PT2	Programmable Output (M2: Gray/Binary Code Output)	
PT3	Programmable Output (M3: Gray/Binary Code Output)	
KRC	Contactors Feed-back Input	
S2A-S2B	Group Operation Communication Terminals	
S1A-S1B	Car Communication Terminals (for comm. with FX-SERI boards)	
1000	Signal Circuit Ground	
100	Signal Circuit Supply (+24Vdc)	
PTC	Motor Thermistor & Panel Thermostat Oil Thermostat Input (Hydraulic) & Brake Resistor Thermostat (VVVF)	
K19	Door Close Limit Switch Input	These inputs must be bridged to terminal 100 when door limit switches are not checked by ARL-300 controller (excluding 1-phase and 3-phase automatic lift doors)
K16	Door Open Limit Switch Input	
PR	Programmable Relay Common Input	The function of this output is assigned from the menu.
PRA	Programmable Relay Output	
XK1	To XK1 plug on KBK4 Connection Board with 14-wire flat cable	
XK2	To XK2 plug on KBK2 Connection Board with 20-wire flat cable	
XK3	To XK3 plug on KBK2 Connection Board with 20-wire flat cable	

14.2. Relay Output Terminals According to Drive Type

Relay Outputs for Two Speed Systems:	
V11	KU1, KU2, KH Contactors Supply Common
VA	Up Direction Contactor (KU2) Output
VB, VC	High Speed Contactor (KH) Output
VD	Down Direction Contactor (KU1) Output
RU	Low Speed Contactor (KF) Output
11	Low Speed Contactor (KF) Supply Common

Relay Outputs for VVVF Systems (*):			
	Geared drive (Asynchronous machine)	Gearless drive (Asynchronous machine)	
		Evacuation with Brake Releasing	Evacuation with Active Motor Driving
V11	VVVF Signals Supply Common	VVVF Signals Supply Common	VVVF Signals Supply Common
VA	Up Direction Signal Output	Up Direction Signal Output	Up Direction Signal Output
VB, VC	High Speed Signal Output	High Speed Signal Output	High Speed Signal Output
VD	Down Direction Signal Output	Down Direction Signal Output	Down Direction Signal Output
AV1	Low Speed Signal Common	Automatic Evacuation Signal Common	Evacuation Active Contactor Supply Common
AV2	Low Speed Signal Output (**)	Automatic Evacuation Signal Output	Evacuation Active Contactor Output
RE1	Inspection Speed Signal Common	Inspection Speed Signal Common	Mains Active Contactor Supply Common
RE2	Inspection Speed Signal Output (***)	Inspection Speed Signal Output	Mains Active Contactor Output
RU	Main Contactors Output	Main Contactors Output	Main Contactors Output
11	Main Contactors Supply Common	Main Contactors Supply Common	Main Contactors Supply Common

*: The type of VVVF system (geared or gearless) is determined by the paramater "**RESCUE TYPE**".
**: For gearless drive with ADrive Inverter, the low-speed signal should be given from up and down signals in parallel with diodes.
***: For gearless drive uses active motor driving as evacuation method, the inspection speed signal should be given from a normally closed contact of an additional relay which should be activated from the terminal 869EK on KBK-4 board.

Relay Outputs for Hydraulic Systems:	
V11	Valve Group Supply Common
VA	Slow-Up Valve Output
VB	Fast-Up Valve Output
VC	Slow-Down Valve Output
VD	Fast-Down Valve Output
AV1	Emergency Valve Supply Common
AV2	Emergency Valve Output
RE1	Operation Mode Selection Contactor Supply Common
RE2	Operation Mode Selection Contactor Output
RU	Up Contactor Output
RD	Delta Contactor Output
RS	Star Contactor Output
11	Contactor Supply Common

14.3. Terminals & Plugs On KBK4 Connection Board

869	Inspection Switch Input (From Inspection Box)		
500	Parallel car installation	Inspection Down Button Input	
	Serial car installation	Call Cancel Button Input (The common of signal must be taken from inspection signal 869)	
501	Inspection Up Button Input		
YAN	Fire Alarm Switch Input		
DEP	Earthquake Sensor Contact Input		
DTS	Parallel car installation	Door Close Button Input	
	Serial car installation	Door Fully Closed Limit Switch Input (for fire-fighters lift)	
K20	Parallel car installation	Door Open Button & Door Pressure Contact & Photocell Contact Input	
	Serial car installation	Door Fully Open Limit Switch Input (for fire-fighters lift)	
804	Parallel car installation	Over-load Contact Input	
	Serial car installation	Fireman Switch (in car operation panel) Input (for fire-fighters lift)	
805	Parallel car installation	Full-load Contact Input	
	Serial car installation	Panic (Evacuation) Button Input (for panic function)	
VAT	Car Priority Switch Input		
817	Down Limit Mechanical Switch Input		
818	Up Limit Mechanical Switch Input		
PI	Programmable Input	For VVVF systems	Inverter Error Signal Input
		For Hydaulic systems	External Contactor Checback Signal (when external contactors are used for hydraulic valve blocks like Beringer, GMV, etc.)
869EK	The End of Inspection Singal Input (Inspection operation + Recall operation >To Control Card)		
XK1	To XK1 plug on ARL-300 Controller Board with 14-wire flat cable		

If Recall Hand Terminal is not connected to panel	If Recall Hand Terminal is connected to panel
Use jumper	Do not use jumper

Figure-1 : KBK4 board jumper selection (two pins)

14.4. Terminals & Plugs On KBK2 Connection Board

190	Not used. ☞ There is no default output signal for common of landing calls (190) for non-collective systems in ARL-300 controller. For this purpose, it is recommended to use an additional relay which will be activated from the busy signal 12 and 1000 (0V). The normally closed contact of the relay is used. The common of NC contact is connected to terminal 1000 (0V) and the contact output is used as 190 signal. Moreover, the parameters "**WAITS AT FLOOR**" and "**CAR LIGHT DELAY**" parameter must be set correctly for non-collective systems.
A-G2	7-Segment Display Output
X1-X16	Car Call / Landing Call Inputs
02	Out of Service Indicator Output
12	Busy Indicator Output
31	Down Arrow Indicator Output
32	Up Arrow Indicator Output
S1A-S1B	Car Communication (FX-SERI) Terminals
S2A-S2B	Group Operation Communication Terminals
XK2	To XK2 plug on ARL-300 Controller Board with 20-wire flat cable
XK3	To XK2 plug on ARL-300 Controller Board with 20-wire flat cable

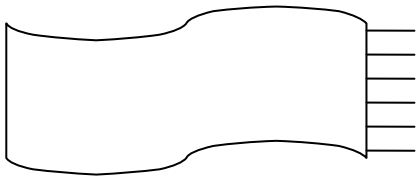
If outputs of 31,32,02 and 12 signals are connected to terminal **100**	If outputs of 31,32,02 and 12 signals are connected to terminal **1000**

Figure-2 : KBK2 board jumper selection (three pins)

15. GENERAL SAFETY REGULATIONS

⚠ All persons performing installation and commissioning work on the ARL-300 Controller must read these chapters and follow the regulations.

⚠ In a lift control system, for a full electrical conformity with EN 81-1/2 standards it is required that controller (control boards), control panel and electrical connections must be proper. ARKEL guaranties that controller and control panel are in conformity with the standards. However external connections of control panel and other electrical connections are under installers' responsibility.



ATTENTION!
Take care while connecting your flexible cable

There are small points to take care while connecting your flexible cable. Arrange your cable order according to their electrical signal level. Although the cables have enough insulation, long parallel cables have transformer effect. The signals can joint between each neighbors. If there is two or more flexible cables it is better to separate low an high voltage signals.

Here is an example of faulty connection.

Cable No:	Signal		Signal level
1	100	(24 Source)	24Vdc
2	A	(Digital segment)	24Vdc
3	B	(Digital segment)	24Vdc
…	...	…	…
10	817	(UP limit Switch)	24Vdc
11	818	(Down limit switch)	24Vdc
12	810	(Magnetic Cam Power-)	180Vdc
13	2001	(Magnetic Cam Power+)	180Vdc
14	804	(Over load)	24Vdc
15	401	(Car Call 1)	24Vdc
16	402	(Car Call 2)	24Vdc
…	…	...	…
20	406	(Car Call 6)	24Vdc
21	2	(Car Lamp)	220Vac
22	1	(Car Power source)	220Vac

In this example ever car lamp on/off operation makes high voltage peaks on line and it can leak to 406 (car call signal). In long term this cause a fault on 406 output transistor. Also there is risk because of Magnetic cam power lines. 818 and 804 signal may have faulty operation in long term.

Here is an example of correct connection order.

100, A, B, C, D, E, F, G, 804, 805, 401, 402, 403, .. , ➔ All 24V signals,
1000, ➔ Signal ground 0V,
PE, N, ➔ Earth Line, Neutral ,
810, 2001, 1, 2, …. ➔ All high voltage signals

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